

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
ALPBET ANALYSES**

REPORT OF SAMPLE DELIVERY GROUP #1100244

Project: Dimock Residential GW Site, Dimock, PA
Analysis method: Gross Alpha and Beta on Water Samples
Report ID: 1100244-ALPBET
Report type: Original
Date reported: 02/15/2012
Total pages in report: 33

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B2.01214P	HW06	PA:DIMOCK	WATER-DRINKING	01/26/2012	01/31/2012
B2.01263Z	HW26	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/01/2012
B2.01264A	HW26-P	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/01/2012
B2.01265B	HW18	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01266C	HW18-P	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01267D	HW20	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01268E	HW20-P	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01269F	FB06	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01270Y	HW13	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01271Z	HW25-P	PA:DIMOCK	WATER-DRINKING	01/30/2012	02/01/2012
B2.01322T	HW33	PA:DIMOCK	WATER-DRINKING	02/01/2012	02/02/2012
B2.01323U	HW33A-P	PA:DIMOCK	WATER-DRINKING	02/01/2012	02/02/2012
B2.01324V	HW32	PA:DIMOCK	WATER-DRINKING	02/01/2012	02/02/2012
B2.01325W	HW32-P	PA:DIMOCK	WATER-DRINKING	02/01/2012	02/02/2012
B2.01326X	HW29Z	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/02/2012
B2.01327Y	HW35A	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/02/2012
B2.01328Z	FB07	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/02/2012
B2.01329A	HW29	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/02/2012
B2.01330T	HW52	PA:DIMOCK	WATER-DRINKING	01/31/2012	02/02/2012
B2.01331U	HW33B-P	PA:DIMOCK	WATER-DRINKING	02/01/2012	02/02/2012

EXCEPTIONS

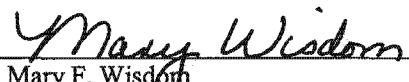
1. **Packaging and shipping**—No problems were observed.
2. **Documentation**—No problems were observed.
3. **Sample preparation**—No problems were encountered.
4. **Analysis**— No problems were encountered.
5. **Holding times**—No holding times were specified.

QUALITY CONTROL

1. **QC samples**—All QC analysis results met NAREL acceptance criteria.
2. **Instruments**—Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

CERTIFICATION

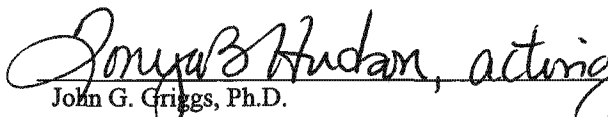
I certify that this data report complies with the terms and conditions of the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.



Mary F. Wisdom
Quality Assurance Manager, NAREL

2-16-12

Date



John G. Griggs, Ph.D.
Director, Center for Environmental Radioanalytical
Laboratory Science

2/16/12

Date

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample (blank spike)
MS	Matrix spike
MSD	Matrix spike duplicate
RBK	Method blank

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "Z scores." A Z score is the number of standard deviations by which the QC result differs from its ideal value. The score is considered acceptable if its absolute value is not greater than 3.

The Z score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference.

The Z score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference. When the precision of paired MS/MSD analyses is evaluated, the native sample activity is subtracted from each measured value and the net concentrations are then converted to total activities before the Z score is computed.

Each standard uncertainty used to compute a Z score includes an additional fixed term to represent sources of measurement error other than counting error. This additional term is not used in the evaluation of reagent blanks.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation.

GENERAL INFORMATION (CONTINUED)

GROSS ALPHA AND BETA ANALYSIS

In comparison to the methods employed to determine radionuclide-specific activities, the method employed by NAREL to determine gross alpha and beta activity in water samples has the potential for greater analytical bias. It should be noted that this potential analytical uncertainty is not included in the two-sigma counting uncertainty term. Therefore, gross alpha and beta results should be used as gross approximations of the alpha and beta activity present.

**U.S.ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

ANALYSIS SUMMARY

Analysis Procedure: NAREL GR-01
Title: Gross Alpha and Beta on Water Samples

NAREL Sample #	QC Type	Preparation Procedure	Date Completed	Assay Batch #	QC Batch #
B2.01214P	DUP	N/A	02/07/2012	0015683T	0008423W
B2.01263Z		N/A	02/07/2012	0015683T	0008423W
B2.01264A		N/A	02/07/2012	0015683T	0008423W
B2.01264A		N/A	02/07/2012	0015683T	0008423W
B2.01265B		N/A	02/07/2012	0015683T	0008423W
B2.01266C		N/A	02/07/2012	0015683T	0008423W
B2.01267D		N/A	02/07/2012	0015683T	0008423W
B2.01268E		N/A	02/07/2012	0015683T	0008423W
B2.01269F	MS	N/A	02/07/2012	0015683T	0008423W
B2.01269F		N/A	02/07/2012	0015683T	0008423W
B2.01270Y		N/A	02/07/2012	0015683T	0008423W
B2.01271Z		N/A	02/07/2012	0015683T	0008423W
B2.01322T		N/A	02/08/2012	0015683T	0008423W
B2.01323U		N/A	02/08/2012	0015683T	0008423W
B2.01324V		N/A	02/08/2012	0015683T	0008423W
B2.01325W		N/A	02/08/2012	0015683T	0008423W
B2.01326X	LCS	N/A	02/08/2012	0015683T	0008423W
B2.01327Y		N/A	02/08/2012	0015683T	0008423W
B2.01328Z		N/A	02/08/2012	0015683T	0008423W
B2.01329A		N/A	02/08/2012	0015683T	0008423W
B2.01330T		N/A	02/08/2012	0015683T	0008423W
B2.01331U		N/A	02/08/2012	0015683T	0008423W
LCS-00630309A *		N/A	02/08/2012	0015683T	0008423W
RBK-00630310T *	RBK	N/A	02/08/2012	0015683T	0008423W

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

PREPARATION METHOD(S) USED

Procedure ID	Title

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01214P	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 16:18	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	7.78e+00	5.3e+00	3.1e+00	PCI/L	02/07/2012 16:18 CST
Beta	8.24e+00	3.3e+00	4.4e+00	PCI/L	02/07/2012 16:18 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01263Z	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 16:18	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.85e+00	4.3e+00	3.7e+00	PCI/L	02/07/2012 16:18 CST
Beta	3.33e+00	2.8e+00	4.1e+00	PCI/L	02/07/2012 16:18 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01264A	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 16:18	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	2.32e+00	4.3e+00	3.4e+00	PCI/L	02/07/2012 16:18 CST
Beta	2.69e+00	2.8e+00	4.2e+00	PCI/L	02/07/2012 16:18 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01264A	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 17:58	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.51e+00	4.0e+00	3.1e+00	PCI/L	02/07/2012 17:58 CST
Beta	2.95e+00	2.7e+00	4.0e+00	PCI/L	02/07/2012 17:58 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01265B	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 17:58	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.65e+00	2.1e+00	1.7e+00	PCI/L	02/07/2012 17:58 CST
Beta	3.42e+00	1.4e+00	1.9e+00	PCI/L	02/07/2012 17:58 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01266C	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 17:58	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	6.37e-01	2.8e+00	2.3e+00	PCI/L	02/07/2012 17:58 CST
Beta	8.29e-01	1.8e+00	2.7e+00	PCI/L	02/07/2012 17:58 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01267D	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 19:39	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.67e+00	3.7e+00	2.8e+00	PCI/L	02/07/2012 19:39 CST
Beta	7.24e-02	2.4e+00	3.7e+00	PCI/L	02/07/2012 19:39 CST

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SAMPLE ANALYSIS REPORT

Sample #:	B2.01268E	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 19:39	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	6.51e-01	1.8e+00	1.6e+00	PCI/L	02/07/2012 19:39 CST
Beta	3.94e-01	1.1e+00	1.6e+00	PCI/L	02/07/2012 19:39 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01269F	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 19:39	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	4.10e-01	1.0e+00	8.5e-01	PCI/L	02/07/2012 19:39 CST
Beta	3.53e-01	1.0e+00	1.5e+00	PCI/L	02/07/2012 19:39 CST

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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01269F	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	MS
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 21:19	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	8.82e+01	1.9e+01	8.0e-01	PCI/L	02/07/2012 21:19 CST
Beta	6.40e+01	8.3e+00	4.4e+00	PCI/L	02/07/2012 21:19 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01270Y	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 21:19	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	2.83e+00	2.3e+00	1.7e+00	PCI/L	02/07/2012 21:19 CST
Beta	1.04e+00	1.2e+00	1.7e+00	PCI/L	02/07/2012 21:19 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01271Z	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 21:19	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	2.54e+00	4.1e+00	3.2e+00	PCI/L	02/07/2012 21:19 CST
Beta	1.60e+00	2.7e+00	4.1e+00	PCI/L	02/07/2012 21:19 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01322T	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 22:59	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	2.13e+00	4.0e+00	3.0e+00	PCI/L	02/07/2012 22:59 CST
Beta	3.78e-01	2.5e+00	3.8e+00	PCI/L	02/07/2012 22:59 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01323U	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 22:59	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.04e-01	3.9e+00	3.7e+00	PCI/L	02/07/2012 22:59 CST
Beta	1.90e+00	2.7e+00	4.0e+00	PCI/L	02/07/2012 22:59 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
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SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01324V	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/07/2012 22:59	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.16e+00	1.9e+00	1.5e+00	PCI/L	02/07/2012 22:59 CST
Beta	2.23e+00	1.3e+00	1.8e+00	PCI/L	02/07/2012 22:59 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01325W	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 00:40	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	6.15e-02	1.7e+00	1.4e+00	PCI/L	02/08/2012 00:40 CST
Beta	1.67e+00	1.2e+00	1.7e+00	PCI/L	02/08/2012 00:40 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01326X	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	5.000e-02 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 00:40	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.61e+00	8.2e+00	7.5e+00	PCI/L	02/08/2012 00:40 CST
Beta	7.11e+00	5.7e+00	8.3e+00	PCI/L	02/08/2012 00:40 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01327Y	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 00:40	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	9.53e-01	1.8e+00	1.4e+00	PCI/L	02/08/2012 00:40 CST
Beta	1.78e+00	1.2e+00	1.7e+00	PCI/L	02/08/2012 00:40 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01328Z	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	Aqueous		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 02:20	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	2.08e-01	1.7e+00	1.3e+00	PCI/L	02/08/2012 02:20 CST
Beta	2.37e+00	1.8e+00	2.5e+00	PCI/L	02/08/2012 02:20 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01329A	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 02:20	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.30e+00	2.2e+00	1.9e+00	PCI/L	02/08/2012 02:20 CST
Beta	2.43e+00	1.4e+00	2.0e+00	PCI/L	02/08/2012 02:20 CST

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01330T	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	2.500e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 02:20	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	6.68e-01	1.7e+00	1.4e+00	PCI/L	02/08/2012 02:20 CST
Beta	1.39e+00	1.2e+00	1.7e+00	PCI/L	02/08/2012 02:20 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	B2.01331U	QC batch #:	0008423W
Matrix:	WATER-DRINKING	Assay batch #:	0015683T
Sample type:	SAM	Prep procedure:	N/A
Amount analyzed:	1.000e-01 L	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 04:00	100.0	G54B	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	-1.93e-01	3.5e+00	2.9e+00	PCI/L	02/08/2012 04:00 CST
Beta	1.40e+00	2.5e+00	3.8e+00	PCI/L	02/08/2012 04:00 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	LCS-00630309A	QC batch #:	0008423W
Matrix:	N/A	Assay batch #:	0015683T
Sample type:	N/A	Prep procedure:	N/A
Amount analyzed:	1.000e+00 SAMP	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 04:00	100.0	G54C	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	1.39e+01	3.1e+00	3.7e-01	PCI	02/08/2012 04:00 CST
Beta	1.53e+01	1.8e+00	1.0e+00	PCI	02/08/2012 04:00 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG #1100244

SAMPLE ANALYSIS REPORT

Sample #:	RBK-00630310T	QC batch #:	0008423W
Matrix:	N/A	Assay batch #:	0015683T
Sample type:	N/A	Prep procedure:	N/A
Amount analyzed:	1.000e+00 SAMP	Analysis procedure:	NAREL GR-01
Dry/wet weight:	N/A	Analyst:	CHD
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
02/08/2012 04:00	100.0	G54D	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Date
Alpha	8.19e-02	3.5e-01	3.0e-01	PCI	02/08/2012 04:00 CST
Beta	8.61e-02	2.6e-01	3.9e-01	PCI	02/08/2012 04:00 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL AIR AND RADIATION ENVIRONMENTAL LABORATORY**

SDG 1100244

QC BATCH SUMMARY

QC batch #: 0008423W
Preparation procedure: N/A
Analysis procedure: NAREL GR-01

NAREL Sample #	QC Type	Yield (%)	$\pm 2 \sigma$ Uncertainty (%)	Analyst
B2.01214P	DUP	N/A		CHD
B2.01263Z		N/A		CHD
B2.01264A		N/A		CHD
B2.01264A		N/A		CHD
B2.01265B		N/A		CHD
B2.01266C		N/A		CHD
B2.01267D		N/A		CHD
B2.01268E		N/A		CHD
B2.01269F	MS	N/A		CHD
B2.01269F		N/A		CHD
B2.01270Y		N/A		CHD
B2.01271Z		N/A		CHD
B2.01322T		N/A		CHD
B2.01323U		N/A		CHD
B2.01324V		N/A		CHD
B2.01325W		N/A		CHD
B2.01326X		N/A		CHD
B2.01327Y		N/A		CHD
B2.01328Z	LCS	N/A		CHD
B2.01329A		N/A		CHD
B2.01330T		N/A		CHD
B2.01331U		N/A		CHD
LCS-00630309A *	LCS	N/A		CHD
RBK-00630310T *	RBK	N/A		CHD

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**National Air and Radiation Environmental Laboratory
QC Batch Report**

QC Batch #: 0008423W

Analytical Method: NAREL GR-01

METHOD BLANKS (PCI)

Sample ID	Nuclide	Activity $\pm 2\sigma$	Prep Date	Flags
00630310T	ALPHA	8.19e-02 \pm 3.5e-01	2012-02-06	OK
00630310T	BETA	8.61e-02 \pm 2.6e-01	2012-02-06	OK

LABORATORY DUPLICATES (PCI/L)

Sample ID	Nuclide	Original $\pm 2\sigma$	Duplicate $\pm 2\sigma$	RPD	Z
B2.01264A	ALPHA	2.32e+00 \pm 4.3e+00	1.51e+00 \pm 4.0e+00	42.37	-0.28 OK
B2.01264A	BETA	2.69e+00 \pm 2.8e+00	2.95e+00 \pm 2.7e+00	9.12	0.13 OK

MATRIX SPIKES (PCI/L)

Sample ID	Nuclide	Amt Added $\pm 2\sigma$	Native $\pm 2\sigma$	Measured $\pm 2\sigma$	%R	Z
B2.01269F	ALPHA	6.96e+01 \pm 2.2%	4.10e-01 \pm 1.0e+00	8.82e+01 \pm 1.9e+01	126.12	1.95 OK
B2.01269F	BETA	6.20e+01 \pm 2.2%	3.53e-01 \pm 1.0e+00	6.40e+01 \pm 8.3e+00	102.67	0.39 OK

LAB CONTROL SAMPLES (PCI)

Sample ID	Nuclide	Amt Added $\pm 2\sigma$	Measured $\pm 2\sigma$	%R	Z
00630309A	ALPHA	1.74e+01 \pm 2.2%	1.39e+01 \pm 3.1e+00	79.84	-2.22 OK
00630309A	BETA	1.55e+01 \pm 2.2%	1.53e+01 \pm 1.8e+00	98.33	-0.28 OK

Analyst:

CH de P -
duBose, C H

10 Feb 2012

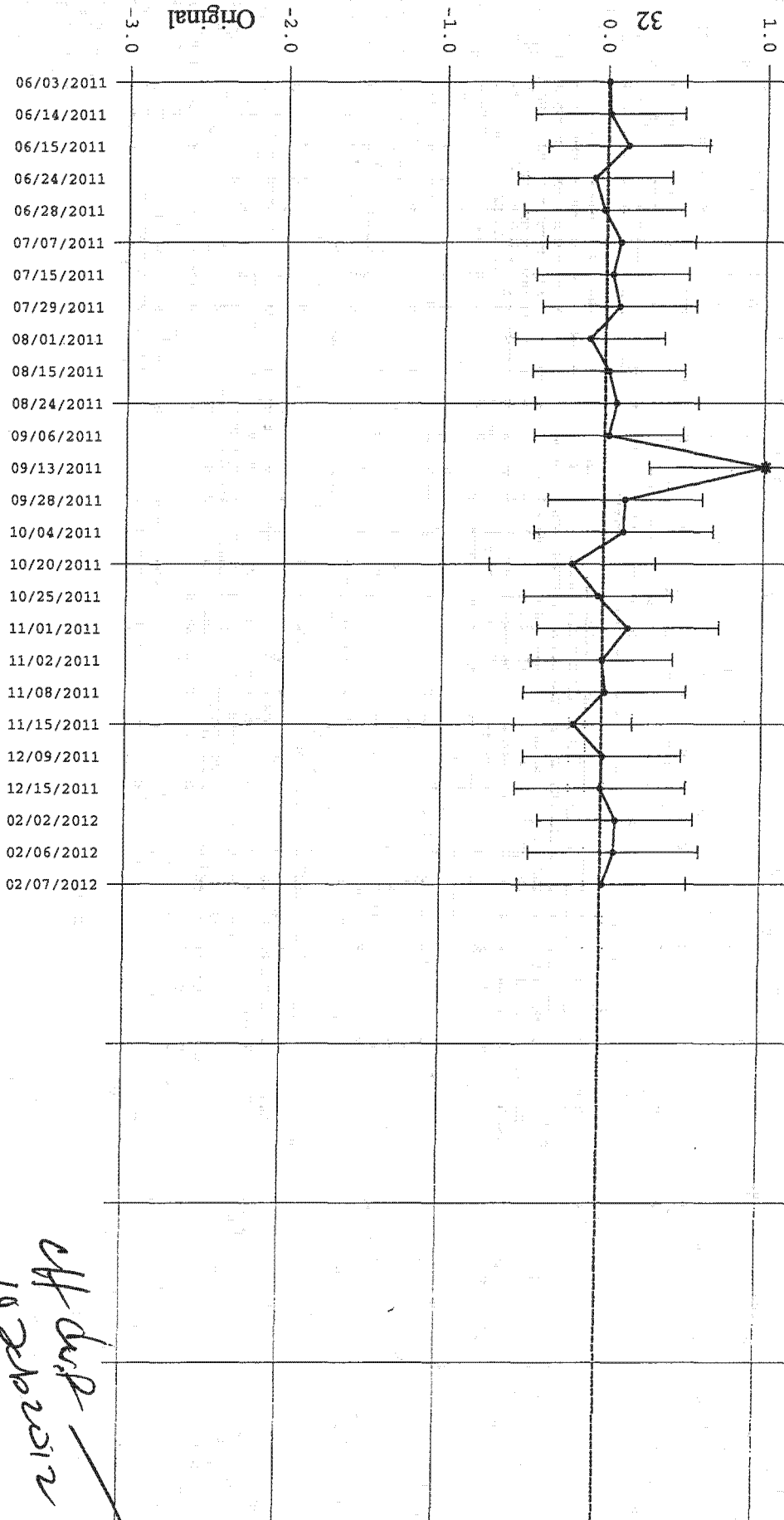
QA Officer:

Karl J. McEwen

2/13/12

Method Blanks
Analyte: ALPHA
Method: NAREL GR-01
Analyst: duBose, CH

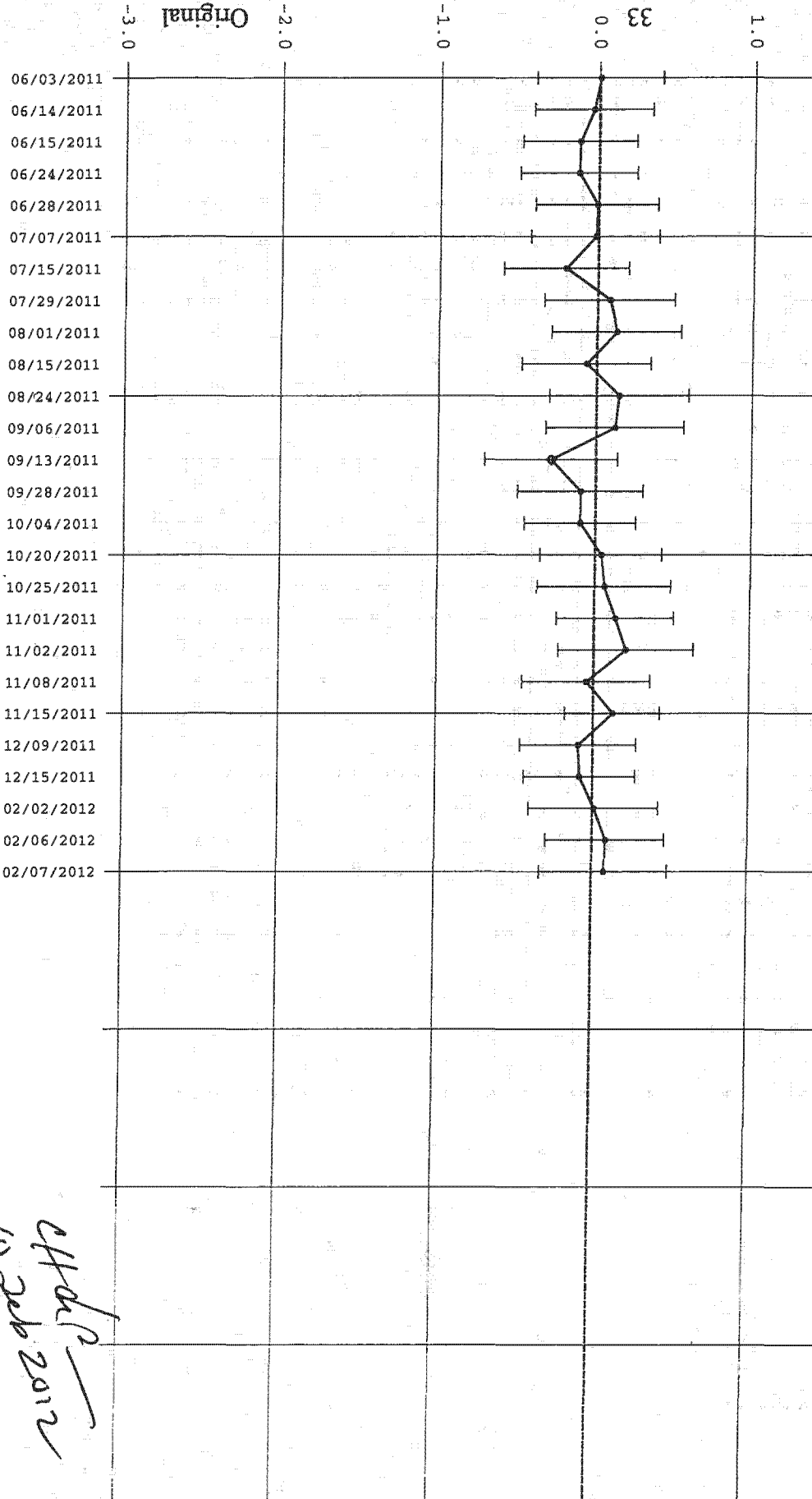
Report: 1100244-ALPBET



CH duBose
10/20/2012

Method Blanks
Analyte: BETA
Method: NAREL GR-01
Analyst: duBose, CH

Report: 1100244-ALPBET



CH de
10 Feb 2012